

**SECTION 11 12 00**  
**PARKING CONTROL EQUIPMENT**

**PART 1 GENERAL:**

**1.1 DESCRIPTION:**

- A. Section Includes:
  - 1. Automatic Barrier Gates.
  - 2. Vehicle Detectors.
  - 3. Card Control Units.

**1.2 RELATED WORK:**

- A. Asphaltic paving: Section 32 12 16, ASPHALT PAVING.
- B. Concrete paving: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.
- C. Concrete foundation work: Section 03 30 00, CAST-IN-PLACE CONCRETE.
- D. Color and texture: Section 09 06 00, SCHEDULE FOR FINISHES.
- E. Conduit placement for equipment: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS, Section 27 05 33, RACEWAYS AND BOXES FOR COMMUNICATIONS SYSTEMS and Section 28 05 33, RACEWAYS AND BOXES FOR ELECTRONIC SAFETY AND SECURITY.
- F. Power supply to disconnect, junction box, in gate arm unit: Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW), Section 27 15 00, COMMUNICATIONS HORIZONTAL CABLING.
- G. Electrical characteristics and wiring connections: Section 26 27 26, WIRING DEVICES.
- H. Work by Government:
  - 1. Card Access System.
  - 2. Coded cards.

**1.3 QUALITY CONTROL:**

- A. Qualifications:
  - 1. Approval by Contracting Officer is required of products or service of proposed manufacturer, suppliers, and installers, and will be based upon submission by Contractor of certification that:
    - a. Installer: Approved by manufacturer of materials and has technical qualifications, experience, trained personnel and facilities to install specified items.
    - b. Manufacturer's product submitted has been in satisfactory operation, on three installations similar and equivalent in size to this project, for three years. Submit list of installations.

2. Maintenance Proximity: Installer shall maintain a place of business with maintenance facilities not more than two (2) hours normal travel time from project site.
3. UL and NEMA Compliance: Provide internal electrical components required as part of parking control equipment that are listed by UL and comply with applicable NEMA standards.
4. Single-Source Responsibility: Obtain parking control equipment from one source and from a single manufacturer.

**1.4 SUBMITTALS:**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, submit following:
  1. Manufacturer's Literature and Data:
    - a. Description of parking control equipment material and accessories to be provided.
    - b. Provide data on operating equipment, characteristics and limitations, and operating temperature ranges.
  2. Samples:
    - a. Submit two samples of access cards and security program, illustrating size, and coding method.
  3. Shop Drawings and Certificates: Indicate plan layout of equipment access lanes, mounting bolt dimensions, conduit and outlet locations, power requirements, and conformation of building electrical requirements. Provide Contractor with mounting bolt template in time for installation.
  4. Wiring Diagrams: Detailing wiring for parking control equipment operator, signal, and control systems differentiating clearly between manufacturer-installed wiring and field-installed wiring.
    - a. Show locations of connections to electrical service provided as a unit of work under other Divisions.
  5. Maintenance Data: For parking control equipment components for inclusion in Operating and Maintenance Manuals, include the following:
    - a. Maintenance Instructions: Provide manufacturer's instructions for maintenance of parking control equipment.
      - 1) Include recommended methods and frequency for maintaining equipment in optimum operating condition under anticipated traffic and use conditions.

- 2) Include precautions against materials and methods that may be detrimental to finishes and performance.
- 3) Lubrication Schedule and Information: Provide lubrication and periodic maintenance requirement schedules including parts list and parts numbers.
- 6. Operation Data: Provide operating data for operating equipment, including clock timer, changing security access code, and any other pertinent information required for Government operation.
- 7. Certificates: Quality Control Certificate Submittals and lists specified in paragraph, QUALIFICATIONS.
- B. In accordance with Section 00 72 00, GENERAL CONDITIONS, submit following at project closeout: Warranty.
- C. In accordance with Section 01 00 00, GENERAL REQUIREMENTS, submit following at project closeout: Warranty.
- 1. Project Record Documents: Record actual locations of concealed conduit and vehicle detection activators.

**1.5 REGULATORY REQUIREMENTS:**

- A. Products Requiring Electrical Connection: Listed and classified by UL testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

**1.6 PROJECT CONDITIONS:**

- A. Coordinate placement of conduit, accessories, and power wiring to operating equipment.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

**1.7 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver materials to site in original sealed packages or containers; labeled for identification with manufacturer's name and brand.
- B. Store materials in weathertight and dry storage facility. Protect from damage due to handling, weather, and construction operations before, during and after installation.

**1.8 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing Materials (ASTM):

A153/A153M-05.....Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

A500 (Rev A)-03.....Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

A653/A653M-07.....Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

C. National Electrical Manufacturers Association (NEMA):

MG 1-06.....Motors and Generators.

D. National Fire Protection Association (NFPA):

70-07.....National Electrical Code.

E. Underwriters Laboratories Inc. (UL):

Electrical Appliance and Utilization Equipment Directory.

#### **1.9 SYSTEM DESCRIPTION:**

A. Parking Control System: Automatic operation at entrance and automatic operation at exit.

B. Design: Protect against interference or damage by lightning or other electrical influence; include fuse, over-voltage protection, flash-over protection, and line filter.

C. Entry - Automatic Gate Arm Control: Electrically operated upon insertion of coded card. Activate automatic arm reversing switch if an obstacle is sensed in downward motion.

D. Exit - Automatic Gate Arm Control: Electrically operated upon detection of vehicle by sensing loop buried in pavement. Activate automatic arm reversing switch if an obstacle is sensed in the downward motion.

#### **1.10 SCHEDULING:**

A. Name Street Gate: Automatic key card operation, single gate arm, single gate exit arm activated with loop detector in pavement, and heated cabinets.

B. Employee Gate: Automatic key card operation, single gate arm, single gate exit arm activated with loop detector in pavement, and heated cabinets.

#### **1.11 WARRANTY**

A. Submit manufacturer's written warranty for materials and installation in accordance with FAR clause 52.246-21.

1. Warranty: Cover keeping equipment operational.

2. Final Acceptance: Requirement for final acceptance shall be continued acceptable use of parking control equipment without a breakdown or stoppage for a period of fifteen (15) calendar days after final acceptance of project by Government.

**PART 2 PRODUCTS****2.1 PARKING CONTROL EQUIPMENT**

- A. Parking Products, Inc. (Basis-For Design Guide)  
2517 Wyandotte Road  
Willow Grove, PA 19090  
(215) 657-7500
- B. American Parking Equipment Inc.  
535 Oxford Street  
Etobicoke, Toronto, Ontario M8Y 1E5  
(800) 565-4666.
- C. Amano Parking Systems  
140 Harrison Avenue  
Roseland, NJ 07068  
(800) 367-6649
- D. Delta Scientific Corporation  
24901 West Avenue Stanford  
Valencia, CA 91335  
(800) 521-9330
- E. Federal APD  
24700 Crestview Court  
Farmington Hills, MI 48335  
(800) 521-9330
- F. Magnetic Automation Corporation  
1715 Independence Blvd., Suite. B-7  
Sarasota, FL 34234  
(941) 351-7116

**2.2 MATERIALS:**

- A. Iron and Steel Hardware: ASTM A153; Zinc coating (hot-dip) on iron and steel hardware.
- B. Steel: ASTM A653/A653M; Galvanized to G90 Z275.
- C. Structural tubing in rounds and shapes: A500; Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- D. Aluminum:
  - 1. Sheet: ASTM B 209M (ASTM B209).
  - 2. Extruded Shapes: ASTM B 221 M (ASTM B221).

**2.3 UNIVERSAL GATE UG-141 (EMPLOYEE GATE):**

- A. Housing: The housing shall be weather proof and constructed of heavy gauge steel not less than #14. All seams, joints and supports shall be electric bead weld. Spot welds are not acceptable for housing

construction. Access to the motor compartment shall be provided by a removable top cover secured by latches located inside the housing. Access to the interior of the housing shall be provided by a full length gasketed key locked door. The door and top shall be designed to retard unauthorized entry, tampering and vandalism. An opening of 6 inches by 12 inches shall be provided at the bottom of the housing for conduits and field wiring. The gate shall be painted in a powder coat finish applied over a suitable primer.

- B. Control Circuitry: All control circuitry, etc. shall be contained in one easily removable sealed housing hereinafter referred to as the gate controller. All electrical connections to the gate controller shall be made with pluggable terminal blocks. One standard gate controller shall be capable of providing all system logic as well as manual functions. The gate controller shall provide inputs for connection of any peripheral equipment such as loop detectors, ticket machines, card readers, etc. The operating mode of the gate shall be determined by routing the control wires of these devices to their proper inputs. No re-programming of the gate controller shall be necessary. A manual UP/DOWN switch shall be provided.
- C. Gear Motor: The gate arm drive assembly shall be directly gear driven by a gear motor. No belt, pulley, or chain drive shall be acceptable. The 1/3 H.P. motor shall conform to NEHA standards. The motor shall be instantly reversible electrically via bi-directional solid state AC switches driven by solid state trigger circuits located inside the gate controller. No mechanical stops, breaks, clutches, etc., shall be acceptable. Vertical and horizontal gate arm stopping positions shall be controlled by independently adjustable micro-switches. The micro-switch assembly shall be located on the gear motor. Provisions shall be made for easy field adjustment. It shall be possible to open the gate manually by means of a hand crank in case of power failure.
- D. Gate Arm: Gate arm length shall be a maximum of 12 feet. The gate arm shall be clamped to the unit by means of a screw on bracket in order to provide a break-away feature. Remounting of gate arms shall not require the drilling of holes.
- E. Options:
1. An articulating gate arm shall be provided for installations with limited overhead clearance. The gate arm shall be two wooden pieces

- driven and firmly supported by metal side brackets and a single adjustable steel rod. Wood side brackets shall not be acceptable.
2. A gate arm rebound feature shall be provided in-case an object is struck by the gate arm. If the gate arm comes into contact with an object during the closing cycle, sufficient non-destructive pressure shall cause the gate motor to instantly reverse and return the gate arm to the full open position. Pressure applied to the gate arm while in the full closed position shall not activate the motor to raise the arm. The rebound sensor shall be a part of the gate arm drive shaft contained within the locked gate housing. Positive electrical contact of this feature shall be provided to prevent recycling. A timer can be incorporated in the gate circuitry to automatically lower the gate arm after a rebound activation providing the closing loop is not occupied by a vehicle.
  3. A heater controlled by a thermostat shall be provided for installations operating in cold climates.

## F. Technical Data:

1. Housing:	Weatherproof #14 Ga. Steel construction, flush, tamper proof full length door, removable hood for easy access off the ground, rust resistant feet, powder coat finish.
2. Motor Drive:	1/3 HP heavy duty motor direct drive.
3. Gate Arm:	Wooden arm up to 12 ft. (3.5m) PVC or aluminum arms optional
4. Control Circuitry	Sealed, self-contained plug-in controller.
5. Power:	110VAC, 60 Hz, 10 Amps (220VAC, 50 Hz, 6Amps optional)
6. Environmental:	Operating temperature: -5°F to 160° (-20° to 70°C)
7. Mechanical	46" H x 18" W x 12" D (1168mm x 457 mm x 305 mm)
8. Weight	170 lbs. (77 Kg)

**2.4 POWER GATE PG-541 (ENTRANCE TO L07 7-18'-0") :**

## A. Housing:

1. The housing shall be weather proof and constructed of heavy gauge steel not less than #14. All seams, joints and supports shall be electric bead welded. Spot welds are not acceptable for housing construction.

2. Access to the motor compartment shall be provided by a removable top cover secured by latches located inside the housing. Access to the interior of the housing shall be provided by a key locked door. The door and top shall be designed to retard unauthorized entry, tampering and vandalism. An opening 6 inches by 12 inches shall be provided at the bottom of the housing for conduits and field wiring.
3. The finish shall consist of a powder coat finish applied over a suitable primer.

B. Control Circuitry:

1. All control circuitry, logic, motor starting circuitry, etc., shall be contained in one easily removable sealed housing hereinafter referred to as the gate controller. All connections to the controller shall be made through easily accessible screw terminals.
2. One standard controller shall be capable of providing all system logic as well as manual functions.
3. Operational mode changes shall be accomplished by jumpers on a termination panel. No circuitry changes, modifications, additions or deletions shall be required to accomplish these mode changes.
4. The gate controller shall contain a magnetic type circuit breaker for overload protection. Thermal type overload circuit breakers will not be acceptable as these devices change in characteristic according to changes in ambient temperature. A switch shall be provided for manual up/down control.

C. Gate Arm Drive Assembly:

1. The gate arm drive assembly shall be directly linked to the gear motor assembly by a heavy duty connecting rod. The gate arm shaft shall be moved in harmonic motion. The gate arm travel shall not exceed 5 seconds for raising or lowering. Override stops shall be provided to positively limit the gate arm travel in either the vertical or horizontal position.
2. The gate arm stopping positions shall be independently adjustable via micro-switches. The micro switch assembly shall be located on the larger sprocket drive shaft and provisions must be made for easy field adjustment.

- D. Gate Arm: The gate arm assembly shall consist of a hollow aluminum assembly up to 20 feet in length. The gate arm shall be counter



balanced by weights which can be added to the opposite side of the gate arm bracket assembly.

E. Technical Data:

1. Housing:	Weather proof, #14 Ga steel construction flush, tamper proof full length door, removable hood for easy access off the ground, rust resistant feet, powder coat finish
2. Motor Drive:	1/3 HP heavy duty motor Direct drive
3. Gate Arm:	Aluminum, up to 20 feet.
4. Control Circuitry:	Self contained, sealed, plug-in controller
5. Environmental:	Operating temperature: 0 deg. F to 110 deg. F (-20 deg. C to 45 deg. C)
6. Mechanical:	46" H x 18 1/4 W x 12 1/4" D (1170mm x 460mm x 310mm)
7. Weight:	300 lbs. (156 Kg)

## 2.5 ELECTRICAL CHARACTERISTICS AND COMPONENTS:

A. Electrical Characteristics:

1. Provide 1/3 hp rated load amperes.
2. Provide 110 volts AC, single phase, 60 Hz.
3. Provide 10 amperes maximum circuit breaker size overcurrent protection.
4. Refer to Section 26 27 26, WIRING DEVICES: Electrical connections.

## 2.6 CARD CONTROL:

- A. General: Provide pedestal mounted card control units to activate barrier gates.
- B. Control Unit: To activate gate arm by insertion of coded card RSA certified.
- C. Cabinet: 1.9 mm (0.075 inch) minimum welded cold-rolled steel sheet, weather tight seams; thermally insulated to permit heater to maintain cabinet temperature to equipment operating minimum, flush access doors and panels, tamper proof flush mounted lock hardware and two (2) keys master keyed to operate access panel, weather tight gaskets. Conceal mounting bolts inside units.
1. Mount housing on a 50 mm (2 inch) square steel tube pedestal with a curved top to receive housing, and a trim plate to cover anchor bolts.

2. Finish interior and exterior of cabinet with manufacturer's standard baked enamel finish over primer. Color as indicated in Section 09 06 00, SCHEDULE FOR FINISHES.

D. Card Slot: Mount 35-1/2 inches above vehicle pavement surface, illuminate and protect with projecting weather shield.

E. Coded Cards: Provided by Government.

## 2.7 CARD CONTROLLER MCO-630:

### A. Card Reader:

1. The card reader shall be a magnetic device capable of reading areas of discreet magnetic influence electronically coded in a plastic card. The reader shall require no external source of power.
2. A minimum of 10,000 period or code changes shall be possible without changing the reader. Code changes shall be accomplished by changing code plates or matrix cards in the reader.
3. Insertion of a card with the correct code into the reader shall cause a contact closure. Cards without the proper code will have no effect on the reader.
4. The card reader housing shall be a weather proof enclosure of #14 ga. aluminum with a lockable front plate. The enclosure shall be suitable for wall or pedestal mounting.

### B. Contract I. D. Card:

1. The contract I. D. card shall be a heavy duty plastic card 3-3/8 inches x 2-1/8 inches with a barium ferrite core.
2. The card shall be capable of being magnetically encoded to operate the series MCO-630 reader. The construction of the card shall permit recoding, thereby eliminating the need for purchasing new sets of cards each time the system code is changed.
3. Include custom imprinting and I.D. pictures to the cards.

### C. Technical Data:

1. Power:	Magnetic, now power required.
2. Output:	Normally open contact.
3. Dimensions:	8-1/2" W x 8" D x 5" H (215 mm x 203 mm x 127 mm)
4. Weight:	3 lbs. (1.3 Kg)
5. Environmental:	Operating temperature: -5 deg. F to 160 deg. F (-20 deg. C to 70 deg. C)
6. RSE certified	
7. Housing:	Match parking gate housing.
8. Intercom CVA printed out and installed shall be included with this system.	

**2.8 VEHICLE DETECTION:**

- A. Vehicle Detection: For use in temperature range of -40 to 71 °C; (-40 to 160 °F) to consist of detector unit in conjunction with sensing loop to activate card control barrier gate when vehicle enters or exits.
- B. Loop Wire: 14 gage, XHWN or THWN copper; loop size of 1 200 X 1 800 mm. (48 X 72 inches.)
- C. Loop Groove Fill: Same material as pavement. Hot poured asphalt.

**2.9 FINISHES:**

- A. Gate Arm: Two coat enamel with reflective yellow and white diagonal stripes on both sides of arm.
- B. Gate Posts and Cabinets: Baked enamel on steel.

**PART 3 - EXECUTION****3.1 EXAMINATION:**

- A. Verification of existing conditions before starting work:
  - 1. Prior to beginning installation, examine areas to receive parking control equipment. Verify that critical dimensions are correct and that conditions are acceptable:
    - a. Do not proceed with installation of parking control equipment until unsatisfactory conditions have been corrected.
- B. Verify that anchor bolts are ready to receive work and dimensions are as indicated on shop drawings and instructed by manufacturer.
- C. Verify that electric power is available and of correct characteristics.

**3.2 PREPARATION**

- A. Provide templates for anchor bolts and other items encased in concrete or below finished surfaces in sufficient time so as not to delay work.

**3.3 INSTALLATION**

- A. Install parking control system and components in accordance with manufacturer's instructions and placement drawings.
- B. Cut grooves in pavement surface, install vehicle detection loops and lead-in wires, and fill grooves with loop filler.
- C. Install internal electrical wiring, conduit, junction boxes, transformers, circuit breakers, and auxiliary components required.

**3.4 ADJUSTING**

- A. Prior to final acceptance of project adjust system components for smooth operation.
- B. Fit and adjust hardware for ease of operation.

1. Lubricate hardware and other moving parts.
2. Readjust parking control system and components at completion of project.

### **3.5 CLEANING**

- A. Clean metal surfaces promptly after installation, exercising care to avoid damage to coatings. Touch up damaged shop-applied finishes as required to restore damaged areas.
- B. Follow recommendations of manufacturer in selection of cleaning agents. Do not use cleaning agents containing ammonia or other compounds that might damage finished metal surfaces.

### **3.6 FIELD QUALITY CONTROL**

- A. Tests:
  1. Test operating functions in accordance with manufacturer's printed checklist.
  2. Correct defects revealed by tests. Retest corrected areas until functions are operating properly.

### **3.7 DEMONSTRATION, TESTING AND ACCEPTANCE**

- A. Instruct Government's personal in proper operation and maintenance of parking control equipment. Train personnel in procedures to follow in event of operational failures or malfunctions.
- B. Acceptance: At completion of project, and as a condition of acceptance, parking control equipment and systems shall be operated for a period of 15 consecutive calendar days without breakdown.

### **3.8 PROTECTION:**

- A. Protect parking control equipment finished surfaces from damage during erection, and after completion of work until final inspection and acceptance.

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